

## **CURRICULUM VITAE**

**Howard J. Hillstrom, Ph.D.**

7255 Beech Road  
Ambler, PA 19002

### **EDUCATION:**

|                                 |       |            |                        |
|---------------------------------|-------|------------|------------------------|
| Drexel University               | Ph.D. | June, 1989 | Biomedical Engineering |
| Worcester Polytechnic Institute | M.S.  | June, 1980 | Biomedical Engineering |
| Worcester Polytechnic Institute | B.S.  | June, 1978 | Electrical Engineering |

### **ACADEMIC AND PROFESSIONAL EXPERIENCE:**

|                   |                                                          |                                                                                                                                                                                                                                                                       |
|-------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1988 –<br>Present | Director of the Gait Study Center<br>Associate Professor | Department of Orthopedics &<br>Department of Community Health and Aging<br>Temple University School of Podiatric Medicine<br>Eighth and Race St., Philadelphia, PA. 19107<br>Direct Dial: (215) 625-5366, fax: (215) 629-0278,<br>E-mail: hhillstrom@TUSPM.Temple.edu |
| 1990 –<br>Present | Visiting Asst. Research Professor                        | School of Biomedical Engineering,<br>Science, and Health Systems<br>Drexel University<br>32nd and Market Streets, Philadelphia, PA 19141<br>(215) 895-2215                                                                                                            |
| 1993 –<br>Present | Clinical Associate Professor                             | Department of Physical Therapy<br>College of Allied Health Sciences<br>Thomas Jefferson University<br>Philadelphia, PA 19107<br>(215) 955-1644                                                                                                                        |
| 1995 -<br>Present | Adjunct Assistant Professor                              | Department of Bioengineering<br>School of Engineering and Applied Science<br>University of Pennsylvania<br>Philadelphia, PA 19104<br>(215) 898-8501                                                                                                                   |
| 1983 -<br>1988    | Biomedical Engineer                                      | Veterans Administration Medical Center<br>University and Woodland Ave<br>Philadelphia, PA. 19104                                                                                                                                                                      |
| 1981 -<br>1983    | Biomedical Engineer                                      | Moss Rehabilitation Hospital<br>12 <sup>th</sup> and Tabor rd.<br>Philadelphia, PA. 19141                                                                                                                                                                             |

## **JOURNAL EDITING AND REVIEWING RESPONSIBILITIES:**

1997 to present - Reviewer for the Journal of Mathematical and Computer Modeling  
1997 to present - Reviewer for the Journal of the Pennsylvania Academy of Science  
1995 to present - Reviewer for the Journal of Clinical Rheumatology  
1992 to present - Contributing Editor for the Journal of the American Podiatric Medical Association  
(JAPMA)  
1990 to present - Reviewer for IEEE Transactions on Biomedical Engineering

## **GRANT REVIEWING RESPONSIBILITIES:**

2002 to present - Reviewer for the American College of Rheumatology Research Education Foundation

## **HONORS AND AWARDS:**

Graduated with "High Distinction" from WPI, June 1978  
Elected to Sigma Xi, Scientific Research Society, 1984  
Silver Stickie Award, JAPMA, 1993  
Third Place for the Scott Alter Memorial Research Award, Journal of Foot and Ankle Surgery, 1998  
Scholl Award for the Outstanding Paper Published in JAPMA, 1999

## **PROFESSIONAL AFFILIATIONS:**

Institute of Electrical and Electronic Engineers (IEEE) and the following constituent societies:  
Engineering Medicine and Biology Society (EMBS), Rehabilitation Engineering, Neural  
Networks, Fuzzy Systems  
International Society of Biomechanics (ISB),  
Gait and Clinical Movement Analysis Society (GCMAS),  
American Rheumatology Health Professionals (ARHP),  
American Association for the Advancement of Science (AAAS)  
Member of the Medical Education and Research Committee Scientific Advisory Board for the  
Eastern Pennsylvania Chapter of the Arthritis Foundation

## **MAJOR RESEARCH INTERESTS:**

Biomechanics of posture and locomotion and the underlying neuromuscular physiology in healthy, athletic, and pathological individuals. The exploration of how lower extremity structure and function are linked to human movement with special attention to alignment, flexibility, coupled motions, and foot type biomechanics. Clinical outcomes research that ascertains conservative and surgical treatment effectiveness. A concentration in the effects of arthritis upon a patient's functional limitations or disability. Static and dynamic modeling of the lower extremity structures for simulation of treatment. Signal processing and system identification, estimation, and control with an emphasis on biological

signals and systems. Biomedical instrumentation, hardware and software, design and development for technology to aid the handicapped (e.g. prosthetics, orthotics, robotics, etc.).

## **RESEARCH AND PROFESSIONAL EXPERIENCE:**

April 1988 to present - Director of the Gait Study Center,  
Associate Professor, Departments of Podiatric Orthopedics & Medicine & Community Health & Aging  
Temple University School of Podiatric Medicine *{formerly the Pennsylvania College of Podiatric Medicine prior to 7/98}* , Philadelphia, PA.

Direct the Gait Study Center and implement a five part mission which is consistent with the objectives to become a " pre-eminent authority on the lower extremity". The strategy entails; (A) enhancing lower extremity biomechanics education, (B) optimizing the clinical gait analysis service, (C) conducting objective research in human biomechanics, gait, and clinical outcomes (D) developing improved quantitative measures of human structure, function, and movement, and (E) improving the infrastructure.

January 1995 to present - Adjunct Assistant Professor of Bioengineering in the School of Engineering and Applied Science, University of Pennsylvania, Philadelphia, PA.

Teach Workshop on Gait Analysis to Summer Rehabilitation Engineering Institute students. Advise graduate students and collaborate with faculty in the areas of Bioengineering, Biomechanics, Gait Analysis, 3D imaging, Arthritis and lower extremity Orthopedics.

November 1993 to present - Clinical Associate Professor,  
Department of Physical Therapy, College of Allied Health and Sciences,  
Thomas Jefferson University (TJU), Philadelphia, Pa.

Conduct research in collaboration with other TJU faculty. Advise Masters Thesis students in biomechanics and gait related topics. Teach workshops in quantitative gait analysis. Collaborate in particular with the Human Performance Laboratory.

July 1990 to present - Visiting Assistant Research Professor School of Biomedical Engineering, Science, and Health Systems *{formerly the Biomedical Engineering and Science Institute}*.  
Drexel University, Philadelphia, PA.

Assisted in the establishment of the D.P.M./Ph.D. program at Drexel and PCPM. Advise graduate students conducting research in Biomechanics and Biomedical Engineering related to Podiatry. Provide workshops or seminar presentations in Gait and Posture Analysis for Biomechanics and Biomedical Engineering students

October 1983 to October 1988 - Biomedical Engineer  
Veterans Administration Medical Center, Philadelphia, PA.

Designed, developed, and evaluated both analog hardware and digital software for the processing of myoelectric signals. Have found minute and hour scale nonstationarities in the EMG - knee moment intent recognition system's input, output and system parameters. Have investigated reference model and returnable or adaptive systems to maintain sub-optimal and optimal estimation of magnitude and direction of intended limb function, (see Doctoral Thesis for theoretical development).

January 1981 to 1983 - Biomedical Engineer (member of Rehabilitation Engineering Center through 1982)  
Moss Rehabilitation Hospital, Philadelphia, PA

Designed and developed myoelectric signal processing techniques for the volitional control of lower limb prostheses. Have conceived, designed and executed research concerned with the optimal electrode placement, control, and quantitative evaluation of advanced prosthetic devices.

1980 (summer) - Awarded a Biomedical Research Grant (BRG) from WPI with Professor Robert Peura, Ph.D. for continued development of the single microelectrode voltage clamp; a unique approach to the study of isolated excitable membranes (cells) using model reference adaptive control (see Master's Thesis for its theoretical development and hardware design).

1978 and 1979 (summer) - Research Assistant, Department of Physiology at University of Massachusetts Medical Center with Professor Joshua Singer, Ph.D. Worked on automated negative capacitance compensation and state of the art front end amplifier design for single cell studies.

1977 (summer) - Scanning Electron Microscopy Course. Student teacher at WPI with Professor Theodore Crusberg, Ph.D.

#### **EXTRAMURAL GRANTS HELD:**

1. "A Quantitative Diagnostic Technique For Discriminating Between Spasticity and Contracture at the Ankle in Patients with Equinus Deformity", H. Hillstrom, Principal Investigator, American Podiatric Medical Association (APMA) award, (1 year term - \$22,825), 1989.
2. "Quantify Equinus Deformity Degree Pre and Post Treatment". H. Hillstrom, Principal Investigator, American Podiatric Medical Association (APMA) award, (1 year - \$25,000), 1990.
3. "The Effect of Orthotics on Stability of the Geriatric Population". G. Hice, Principal Investigator, H. Hillstrom, Co-Investigator, Rockport Walking Institute, (1 year term - \$3,000), 1990.
4. "The Influence of Digital Stabilization on Metatarsalgia", D. Scot Malay, Principal Investigator, H. Hillstrom, Co-Investigator, American Podiatric Medical Association (APMA) award, (1 year term - \$23,342), 1991.
5. "Foot Orthoses: Their Effect on Gait in Down Syndrome", H. Hillstrom, Principal Investigator, G. Hice and L. Selby, Co-Investigators, American Podiatric Medical Association (APMA) award, (1 year term - \$22,310), 1991.
6. "Lower Extremity Shock Transmission Modeling for the Specification of Optimal Insole Designs: A Combined Theoretical and Invivo Approach", H. Hillstrom, Principal Investigator, K. Whitney, J. McGuire, and F. Kugler, Co-Investigators. Schering-Plough Health Care Products Corporation contract, (1 year term - \$42,000) - 1993.
7. "Evaluation of the Doctor Scholl Heel Guard <sup>TM</sup> Device: Clinical Trials and Objective Gait Analysis", H. Hillstrom, Principal Investigator, K. Whitney, J. McGuire, and F. Kugler, Co-Investigators. Schering-Plough Health Care Products Corporation contract, (1 year term - \$79,525), 1993.

8. "Trial Objective Assessment of the Dynamic Stabilizing Innersole System (DSIS) - A Single Subject Design", H. Hillstrom, Principal Investigator, K. Whitney, J. McGuire, and F. Kugler, Co-Investigators. Schering-Plough Health Care Products Corporation contract, (6 months term - \$9,194) 1993.
9. "Geriatric Stability in Posture: The Effect of Foot Orthoses," H. Hillstrom, Principal Investigator, W. Freedman, J. McGuire, A. Helfand, M. Zarro, F. Kugler, Co-Investigators, American Podiatric Medical Association (APMA) award, (1 year term - \$26,870), 1993.
10. "Foot Orthoses: Effect on Tibial Torsion in Down Syndrome", K. Mahan, Principal Investigator, H. Hillstrom, L. Selby-Silverstein, J. Pontious, S. Siegler, F. Kugler, Co-Investigators, American Podiatric Medical Association (APMA) award, (1 year term - \$11,705), 1993.
11. "Initial Objective Assessment of a Preformed Adjustable Insole for Use in a Conventional Diabetic Shoe - A Single Subject Design", H. Hillstrom, Principal Investigator, K. Whitney, J. Song, R. Sherer, and J. McGuire, Co-Investigators, DARCO, contract, (6 month term - \$23,544), 1993.
12. "Six Degree of Freedom Hindfoot Kinematics and Kinetics", H. Hillstrom, Principal Investigator, K. Mahan, S. Corey, K. Whitney, F. Kugler, W. Ledoux, Co-Investigators, APMA award, (1 year term - \$29,680), 1994.
13. "Foot Modeling: Plantar Biomechanical Properties", H. Hillstrom, Principal Investigator, K. Whitney, D. Meeney, G. Bauers, B. Hirsch, W. Ledoux, Co-Investigators, APMA award (1 year term - \$6,040), 1995.
14. "Heel Pain: Six Degrees of Freedom Foot Orthosis Efficacy", K. Whitney, Principal Investigator, H. Hillstrom, S. Sielger, F. Kugler, W. Liu, Co-Investigators, APMA award (1 year term - \$7,340), 1995.
15. "The Biomechanics of Athletic Walking: Optimal Shoe Gear Design", H. Palamarchuk, and H. Hillstrom, Co-Principal Investigators, G. Gualtieri, Co-Investigator, New Balance Corporation, contract, (1 year term - \$52,000), 1996.
16. "Clinical Outcomes of the Evans Calcaneal Osteotomy", K. Mahan, Principal Investigator, H. Hillstrom, Co-Investigator, ACFAS Award, (1 year term - \$6,240), 1996.
17. "Can Orthoses Treat Osteoarthritis Up the Kinetic Chain", H. Hillstrom, Principal Investigator, K. Mahan, H.R. Schumacher, K. Whitney, Co-Investigators, APMA award (1 year term - \$21,690), 1996.
18. "Clinical Outcomes of the Evans Calcaneal Osteotomy", K. Mahan, Principal Investigator, H. Hillstrom, S. Maxian, Co-Investigators, APMA Award, (1 year term - \$6,000), 1996.
19. "Lower Extremity Realignment: Treatment for Osteoarthritis", H. Hillstrom, Principal Investigator, K.T. Mahan, H.R. Schumacher, K. Whitney, J. McGuire, S. Bhimji, Co-Investigators, APMA Award, (1 year term - \$27,699), 1997.
20. "Can Keratolytics Help Manage Plantar Punctate Keratoses", H. Lemont, Principal Investigator, H. Hillstrom, S. Spadone, Co-Investigators, APMA Award, (1 year term - \$18,299), 1997.

21. "Lower Extremity Realignment with the Generation II Valgus Knee Brace: Treatment for Osteoarthritis", H. Hillstrom, Principal Investigator, K.T. Mahan, H.R. Schumacher, K. Whitney, J. McGuire, S. Bhimji, Co-Investigators, Generation II Grant-in-Aid, (1 year term - \$10,400), 1998.
22. "Valgus Knee Bracing and In-Shoe Foot Orthoses: Lower Extremity Realignment Therapy for Varus Knee Osteoarthritis", H. Hillstrom, Principal Investigator, D Brower, S. Bhimji, K. Whitney, J. McGuire, M. Oconnor, and H.R. Schumacher, Co-Investigators, Generation II Bridge Grant, (1 year term - \$60,339), 2000.
23. "Non-invasive In Vivo Method for Measuring Joint Contact Area", B. Hirsch, Principal Investigator, H. Hillstrom, A. Liggins, J. Udupa, Co-Investigators, Eastern Pennsylvania Chapter of the Arthritis Foundation, (1 year term - \$46,283), 2000.
24. "Increasing Awareness and Understanding of New Flexible Footwear Technologies", H. Hillstrom, Principal Investigator, K. Whitney, J. McGuire, J. Song, S. Bhimji, S. McIlwain, L. Newman, Co-Investigators, Flexible Footwear Company in conjunction with the Ben Franklin Partnership, (3 month term - \$5,000), 2001.
25. "Effectiveness of Realignment Orthoses for Off-loading the High Risk Diabetic Foot", J. Song, Principal Investigator, H.J. Hillstrom, G. Boden, J. Walsh, M. O'Connor, Co-Investigators, Temple University Office of the Vice Provost for Research Junior Faculty Grant Program, (1 year term - \$50,000), 2002.
26. "Neuropathic Ulcer Incidence: Role of Foot Malalignment", J. Song, Principal Investigator, H.J. Hillstrom, PhD, G. Boden, MD, C. Homko, RN, PhD, CDE Co-Investigators, Renewal, General Clinical Research Center (GCRC) Grant – NIH, (5 year term – cost covered within the GCRC grant), 2002.
27. "Lower Limb Realignment Therapies for the Treatment of Knee Osteoarthritis", H. Hillstrom, Principal Investigator, D Brower, S. Bhimji, K. Whitney, J. McGuire, M. Oconnor, and H.R. Schumacher, Co-Investigators, Eastern Pennsylvania Chapter of the Arthritis Foundation, (2 year term - \$162,000), 2002.

*Doctoral Dissertation Awards and Summer Research Grants for Students I've Advised*

1. "Orthotics Fitted to Down Syndrome Patients". L. Selby, Principal Investigator, H. Hillstrom, Co-Investigator, Pediatric Section of the APTA award, (1 year term - \$1000), 1989.
2. "The Effect of Foot Orthotics on Gait of Down Syndrome Children with Pes Planus". L. Selby, Principal Investigator, H. Hillstrom, Co-Investigator, American Physical Therapy Association (APTA) doctoral student award, (1 year term - \$12,000), 1990.
3. "The Effect of Foot Orthoses on Gait of Children with Down Syndrome", L. Selby, Principal Investigator, H. Hillstrom, Co-Investigator, Mary E. Switzer Rehabilitation Fellowship. National Institute on Disability and Rehabilitation Research (NIDRR) award, (1 year term - \$42,000), United States Department of Education - 1991.

4. "Biomechanical Foot Model", W. Ledoux, Principal Investigator, H. Hillstrom, Advisor, International Society of Biomechanics (ISB) Doctoral Dissertation Matching Grant. \$2,000 from the ISB and \$2,000 from the Department of Bioengineering, (1 year term), 1998.
5. "Biomechanical and Biochemical Correlates of Conservative Treatments of Knee Osteoarthritis", D. Brower, Principal Investigator, H. Hillstrom and H.R. Schumacher, Advisors, Doctoral Dissertation Award from the Eastern Pennsylvania Chapter of the Arthritis Foundation, (1 year term - \$10,000), 1998
6. "Biomechanical and Biochemical Correlates of Conservative Treatments of Knee Osteoarthritis", D. Brower, Principal Investigator, K. Mahan, H. Hillstrom, and H.R. Schumacher, Advisors, Student Summer Research Fellowship from the American College of Foot and Ankle Surgeons (ACFAS), (3 month term - \$3,000), 1998.
7. "The Effect of Neutral Position Foot Orthoses on Geriatric Stability in Posture", D. Jhaveri, Principal Investigator, H. Hillstrom, Advisor, Student Summer Research Award from the American Podiatric Medical Students Association (APMSA), (3 month term - \$1,000), 1998.
8. "Peg in Hole, End-to-End, and "V" Arthrodesis: A Fresh Cadaveric Comparison of Digital Stabilization", B. Lamm, Principal Investigator, H. Hillstrom and G. Bauer, Advisors, Student Summer Research Award from the American Podiatric Medical Students Association (APMSA), (3 month term - \$1,000), 1998.
9. "Efficacy of Conservative Support and/or Realignment Based Therapies for Managing the CMT Patient", C. Wan, Principal Investigator, H. Hillstrom, Advisor, Student Summer Research Award from the Charcot-Marie-Tooth Association (CMTA), (3 month term - \$4,000), 1998.
10. "Biomechanical and Biochemical Correlates of Conservative Treatments of Knee Osteoarthritis", D. Brower, Principal Investigator, H. Hillstrom and H.R. Schumacher, Advisors, Doctoral Dissertation Award from the Arthritis Foundation, (1 year term - \$10,000), 1999
11. "The Efficacy of Magnetically Laden Insoles In Increasing Arterial Vascular Flow to the Foot", S. Shanahan, Principal Investigator, H. Hillstrom, J. Song, and A. Kidawa, Advisors, Student Summer Research Award from the American Podiatric Medical Students Association (APMSA), (3 month term - \$1,000), 1999.
12. "Efficacy of Balance Padding on Static and Dynamic Foot Function", A. Deroy, B.S., Principal Investigator, B. Lamm, A. Mosheyev, Co-investigators, {K. Whitney and H. J. Hillstrom (Faculty Advisors)}, Student Summer Research Award from the American Podiatric Medical Students Association (APMSA), (3 month term - \$1,000), 2000.
13. "The Biomechanics of the First Metatarsophalangeal Joint: Healthy and Hallux Limitus", Steve Brigido, B.S., Principal Investigator, Jen Berlin, Co-investigator, {J. Song and H. J. Hillstrom (Faculty Advisors)}, Student Summer Research Award from the American Podiatric Medical Students Association (APMSA), (3 month term - \$1,000), 2000

14. "Additional Hindfoot Degrees of Freedom: Modification of a Graphics Based, Anatomically Detailed, Forward Dynamic Simulation of the Stance Phase of Gait", S. Ringleb, M.S., Principal Investigator, H. Hillstrom, S. Siegler, B. Hirsch, and W. Ledoux, (Faculty advisors), International Society of Biomechanics (ISB) Doctoral Dissertation Matching Grant. \$2,000 from the ISB and \$2,000 from the Gait Study Center, (1 year term), 2000

15. "A Comparison of Forefoot versus Rearfoot Balance Pads: Effect on Static and Dynamic Foot Function", Albert Mosheyev, B.S., Principal Investigator, K. Whitney, H. Hillstrom, Advisors, Student Summer Research Award from the American Podiatric Medical Students Association (APMSA), (3 month term - \$1,000), 2001.

16. "First Metatarsophalangeal Joint Flexibility: A Comparison of Hallux Limitus, Functional Hallux Limitus, and Healthy", Steve Brigido, B.S., Principal Investigator, Jen Berlin, Co-investigator, {J. Song and H. J. Hillstrom (Faculty Advisors)}, Student Summer Research Award from the American Podiatric Medical Students Association (APMSA), (3 month term - \$1,000), 2001.

## **PUBLICATIONS:**

### ***THESES***

1. **Hillstrom H:** "The Design and Development of a Differential Headstage for Recording Membrane Potentials and a Design of a Continuous Current Injection Single Microelectrode Voltage and Current Clamp," M.S. Thesis, Worcester Polytechnic Institute (WPI), June, 1980.

2. **Hillstrom H:** "Robust Intent Recognition For the Control of Myoelectric Lower Limb Prosthesis," Ph.D. Thesis, Drexel University, Philadelphia, PA; June, 1989.

### ***BOOK CHAPTERS***

1. **Hillstrom H., Triolo RJ:** EMG Theory, Gait Analysis: Theory and Applications, Editors: R.L. Craik and C.A. Oatis, [Mosby: St. Louis, MO.], 1995.

2. **Hillstrom HJ, Whitney K, McGuire J, Mahan KT, and Lemont H:** "Evaluation and Management of the Foot and Ankle", Clinical Care in the Rheumatic Diseases, 2<sup>nd</sup> Ed. Editors: L. Robbins, M. Hannan. C. Burkhardt, and R DeHoratius. [American College of Rheumatology: Atlanta, GA.], 2001.

3. **Hillstrom HJ, Whitney K, McGuire J, Brower DJ, Riegger-Krugh C, and Schumacher HR:** *Lower Extremity Conservative Realignment Therapies and Ambulatory Aids*, Clinical Care in the Rheumatic Diseases, 2<sup>nd</sup> Ed. Editors: L. Robbins, M. Hannan. C. Burkhardt, and R DeHoratius. [American College of Rheumatology: Atlanta, GA.], 2001.

### ***PEER REVIEWED ARTICLES [in print]***

1. **Siegler S, Hillstrom H, Freedman W, Moskowitz GD:** *The Effect of Myoelectric Signal Processing on the Relationship Between Muscle Force and Processed EMG*, American Journal of Physical Medicine. Vol. 64, No. 3, pgs. 130-149, 1985.



2. Hillstrom H, Perlberg G, Siegler S, Sanner W, Hice G, Downey M, Stienstra J, Acello A, Neary M, and Kugler F: *Objective Identification of Ankle Equinus Deformity and Resulting Contracture*, Journal of the American Podiatric Medical Association. October, 1991.
3. Ruiz J, Christman R, Hillstrom H.: *Anatomical Considerations of the Peroneal Tubercle*, Journal of the American Podiatric Medical Association , Winner of the Silver Stickle Award-, October, 1993.
4. Pontious J, Hillstrom H, Monahan T, and Connolly S: *Talonavicular Coalition: A Review, A Case Report, and an Objective Gait Analysis*, Journal of the American Podiatric Medical Association, July, 1993.
5. Maurer B, Hillstrom H, Siegler S, Kugler F, Hice G, Malay D, Downey M, and Stienstra J: *Objective Diagnosis of Equinus Deformity Based on Walking Performance Prior to and Following a Tibial Nerve Block*, Journal of the American Podiatric Medical Association. . Vol. 84, No. 2, February, 1994.
6. Selby-Silverstein L, Palisano R, Hillstrom H, Kugler F: *Foot Orthoses' Effect on Gait Variability of Children With Down Syndrome*, Excerpta Medica International Congress Series 1070. (XIIth International Posture and Gait Symposium, Matsumoto, Japan, October, 1994.
7. Maurer B, Hillstrom H, Siegler S, Selby-Silverstein S, Downey M, and Farrett W: *Quantitative Identification of Ankle Equinus Deformity with Applicatio*, Gait and Posture, March 1995.
8. Song J, Hillstrom HJ, Secord D, Levitt J: *Foot Type Biomechanics: Comparison of Planus and Rectus Foot Types*, Journal of the American Podiatric Medical Association, vol 86, No. 1, pp 16-23, January 1996.
9. Bauer GR, Hillstrom HJ, Udupa JK, Hirsch BE: *Clinical Applications of Three-Dimensional Magnetic Resonance Image Analysis*, Journal of the American Podiatric Medical Association, vol 86, No. 1, pp 33-37, January 1996.
10. Pontious J, Flanagan KP, Hillstrom HJ: *Role of the Plantar Fascia in Digital Stabilization: A Case Report*, Journal of the American Podiatric Medical Association, vol 86, No. 1, pp 43-47, January 1996.
11. Pontious J, Brook J, Hillstrom HJ: *Tailor's Bunion: Is Fixation Necessary*, Journal of the American Podiatric Medical Association, vol 86, No. 2, pp 63-73, February 1996.
12. Mahan KT, Rock JJ, Hillstrom HJ: *Tarsal Tunnel Syndrome. A Retrospective Study*., Journal of the American Podiatric Medical Association, vol 86, No. 2, pp 81-91, February 1996
13. Selby-Silverstein L, Farrett WD, Maurer BT, Hillstrom HJ: *Gait Analysis and Bivalved Serial Casting of an Athlete with Shortened Gastrocnemius Muscles: A Single Case Design*, JOSPT, vol. 25, No. 4, April 1997.
14. Liu W, Siegler S, Hillstrom H, Whitney K: *Three Dimensional, Six Degrees of Freedom Kinematics During the Stance Phase of Level Walking*, Exercise and Human Movement Science, Vol. 16, pp. 283-298, 1997.

15. Lapointe S, Siegler S, **Hillstrom H**, Nobilini R, Mlodzienski A, Techner L: *Changes in the Flexibility Characteristics of the Ankle Complex Due to Damage of the Lateral Collateral Ligaments: An in vitro and in vivo Study*, Journal of Orthopedics Research, Vol. 15, No. 3, pp 331-341, 1997.
16. Udupa JK, Hirsch BE, Samarasekera S, **Hillstrom H**, Bauer G, Kneeland B: *Analysis of Invivo 3D Internal Kinematics of the Joints of the Foot*, IEEE Transactions of Biomedical Engineering, Vol. 45, No. 11, pp 1387-1396, November, 1998.
17. Mahan KT and **Hillstrom HJ**: *Bone Grafting in Foot and Ankle Surgery: A Review of 300 Cases*, Journal of the American Podiatric Medical Association, Vol. 88, No. 3, pp 109-118, March, 1998. (Scholl Award Outstanding Paper Published - JAPMA, 1999)
18. Barrett, JP, Downey, MS, and **Hillstrom, HJ**: *Rerospective Analysis of Neuropraxia and axonotomesis Injuries of Selected Peripheral Nerves of the Foot and Ankle and Their Conservative and Surgical Treatment (External Neurolysis and Neurectomy)*. Vol. 38, No. 3: pp.185-93J Foot Ankle Surg, 1999.
19. Ledoux, W.R. and **Hillstrom HJ**. Acceleration of the Calcaneus at Heel Strike in Neutrally Aligned and Pes Planus Feet. Clin Biomech (Bristol, Avon). 16:608-13., 2001.
20. Vlahovic, T.C., C.E. Ribeiro, B.M. Lamm, J.A. Denmark, R.G. Walters, T. Talbert, S. Penugonda, J.A. Furnato, D.J. Brower, J. McMahon, S. Bhimji, and **H.J. Hillstrom**, *A Case of Peroneal Neuropathy-induced Footdrop. Correlated and Compensatory Lower-extremity Function*. J Am Podiatr Med Assoc, 90(8): p. 411-20., 2000.
21. Selby-Silverstein, L., **H.J. Hillstrom**, and R.J. Palisano, *The Effect of Foot Orthoses on Standing Foot Posture and Gait of Young Children with Down Syndrome*. NeuroRehabilitation, 2001. 16(3): p. 183-93.
22. LaPointe, S.J., C. Peebles, A. Nakra, and **H. Hillstrom**, *The reliability of clinical and caliper-based calcaneal bisection measurements*. J Am Podiatr Med Assoc, 2001. 91(3): p. 121-6.
23. Lamm, B.M., C.E. Ribeiro, T.C. Vlahovic, G.R. Bauer, and **H.J. Hillstrom**, *Peg-in-hole, end-to-end, and V arthrodesis. A comparison of digital stabilization in fresh cadaveric specimens*. J Am Podiatr Med Assoc, 2001. 91(2): p. 63-7.
24. Lamm, B.M., C.E. Ribeiro, T.C. Vlahovic, A. Fiorilli, G.R. Bauer, and **H.J. Hillstrom**, *Lesser proximal interphalangeal joint arthrodesis: a retrospective analysis of the peg-in-hole and end-to-end procedures*. J Am Podiatr Med Assoc, 2001. 91(7): p. 331-6.
25. Ledoux, W.R. and **H.J. Hillstrom**, *The distributed plantar vertical force of neutrally aligned and pes planus feet*. Gait and Posture, 2002. 15(1): p. 1-9.
26. Gonda, E., G.R. Bauer, **H.J. Hillstrom**, J. Song, H.H. Cho, and L.A. Lundberg, *Stability of the offset V-osteotomy. Test jig development and saw bone model assessment*. J Am Podiatr Med Assoc, 2002. 92(2): p. 82-9.

*PEER REVIEWED ARTICLES [in review or preparation]*

**Hillstrom H, Moskowitz G:** *Robust Intent Recognition for the Control of Myoelectric Lower Limb Prostheses*, IEEE Transactions of Biomedical Engineering, in preparation.

**Bhimji S, Selby-Silverstein L, Hillstrom HJ, Besser M:** *Moment About the Lower Leg in Children with Down Syndrome: the Effect of Foot Orthoses*, in preparation

**Camasta C, Hillstrom H, Minugh Purvis N, Boyd R, Pontious J:** *Is the Human First Metatarsal Actually a Proximal Phalanx?*, Journal of the American Podiatric Medical Association, submitted for publication.

*ABSTRACTS AND CONFERENCE PROCEEDINGS*

1. **Hillstrom H, Siegler S, Freedman W, Moskowitz GD:** *Quantitative Evaluation of Various Myoelectric Signal Processing Techniques*, Proceedings of Tenth Annual Northeast Bioengineering Conference, Dartmouth College, Hanover, NH; March, 1982.
2. **Hillstrom H, Maslar J, Peura R:** *Single Microelectrode Voltage Clamping*, Proceedings of Tenth Annual Northeast Bioengineering Conference. Dartmouth College, Hanover, NH; March, 1982.
3. **Hillstrom H, Maslar J, Peura R:** *Continuous Current Injection Based Single Microelectrode Voltage Clamping*, Proceedings of FASEB (Biomedical Engineering Society), New Orleans, LA; April, 1982.
4. **Hillstrom H, Moskowitz GD:** *Optimal Electrode Placement for Prosthetic Limb Control*, Proceedings of the 35th Annual Conference on Engineering in Medicine and Biology, Philadelphia, PA; September, 1982.
5. **Hillstrom H, Moskowitz GD:** *Optimal Surface EMG Electrode Placement*, Proceedings of the 36th Annual Conference on Engineering in Medicine and Biology, Columbus, OH; September, 1983.
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63. Lit R, Hillstrom HJ, Palamarchuk H, Bhimji S: *The Biomechanics of Female Power Walking: Optimal Shoe Gear Design*, Proceedings of the 3rd Annual Meeting of the Podiatric Research Society, Orlando, FL, Feb. 13, 1998.
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84. Ringleb SI, Ledoux WR, and Hillstrom HJ: *The Effects of Change in Pelvic Height on the Ground Reaction Forces in a Biomechanical Model of the Human Foot Emphasizing the Plantar Soft Tissue*, Proceedings of the 5th Annual Meeting of the Podiatric Research Society, Miami, FL, Feb. 12, 2000.
85. Hillstrom HJ, et al: *Assessment of Conservative Realignment Therapies for the Treatment of Varus Knee OA: Biomechanics and Joint Pathophysiology*, Abstract, 5th Annual Meeting of the Gait and Clinical Movement Analysis Society (GCMAS), Mayo Clinic, Rochester, MN, April 12-15, Gait And Posture, (10)2: 170, 2000.
86. Bhimji S, Deroy AR, Baskin ES, and Hillstrom HJ: *Static and Dynamic Accuracy of the Vicon™ 370*, 5th Annual Meeting of the Gait and Clinical Movement Analysis Society (GCMAS), Mayo Clinic, Rochester, MN, April 12-15, Gait And Posture, (10)2: 170, 2000.
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88. Mahan, KT, Hillstrom, HJ, Bhimji, S, *Biomechanical Efficacy Of The Evans Calcaneal Osteotomy*, 6th Annual Meeting of the Gait and Clinical Movement Analysis Society (GCMAS), Sacramento, CA, Gait And Posture, (11)2: , 2001.
89. Brigido SI, Hillstrom HJ, Bhimji, S, Song J, Berlin J, BrownK, Siegler S.: *First Metatarsophalangeal Joint Flexibility: A Comparison of Hallux Limitus, Functional Hallux Limitus, and Healthy*, Proceedings of the XVIIIth Congress of the International Society of Biomechanics, Zurich, Switzerland, July 8 – 13, 2001.
90. Ringleb SI, Siegler S, Udupa J, Hirsch B, and Hillstrom HJ: *Quantification of Ankle and Subtalar Joint Instability: A New Technique*, Proceedings of the XVIIIth Congress of the International Society of Biomechanics, Zurich, Switzerland, July 8 – 13, 2001.
91. Mosheyev, A, Card, K, Deroy, A, Whitney, K, Song, J, Bhimji, S, Hillstrom, HJ, *A Comparison Of Forefoot Versus Rearfoot Balance Pads: Effect On Static And Dynamic Foot Function*, 7th Annual Meeting of the Gait and Clinical Movement Analysis Society (GCMAS), Chatanooga, TN, Gait And Posture, (12)2:, 2002.

92. **Hillstrom, HJ, Whitney, K, Song, J, McGuire, J, Bhimji, S, McIlwain, S, Newman, L, Crispell, B, Kim, P, Granger, D, *Evidence For A Causal Link Between Shoe Structure and Lower Extremity Function: A Pilot Study*, 7th Annual Meeting of the Gait and Clinical Movement Analysis Society (GCMAS), Chattanooga, TN, Gait And Posture, (12)2:, 2002.**
93. **Hillstrom, H.J., Song, J., Mahan, K.T.: Index of Pronation, VIII EMED Scientific Meeting, July 31<sup>st</sup> – August 3<sup>rd</sup>, 2002, Kananaskis, Alberta, Canada**
94. **Livengood, A., Hillstrom, H.J., Sitler, M.: "Biomechanical Assessment Of The Ankle And Knee During Landing From A Lateral Drop Jump With A Prophylactic Ankle Brace", IVth World Congress of Biomechanics, Calgary, August 4 – 9, 2002.**

## **TECHNICAL REPORTS**

1. **Hillstrom HJ, Whitney K, McGuire J, Kugler F.: "Initial Objective Assessment of the Dynamic Stabilizing Innersole System (DSIS) - A Single Subject Design", A Final Report Submitted to the Dr. Scholl Division of Schering-Plough Health Care Products Corporation, April 1, 1994.**
2. **Hillstrom HJ, Whitney K, McGuire J, Palamarchuk H, Kugler F: "Evaluation of the Dr. Scholl Heel Guard Device: Clinical Trials and Objective Gait Analysis", A Final Report Submitted to the Dr. Scholl Division of Schering-Plough Health Care Products Corporation, May 26, 1995.**
3. **Hillstrom HJ, Ledoux W, Whitney K, McGuire J, Yoo Duke, Song J, Sherer R: "Initial Objective Assessment of a Preformed Adjustable Insole for Use in a Conventional Diabetic Shoe - A Single Subject Design, Phase I - Insole Structural Properties", A Progress Report Submitted to Darco Company, July 12, 1996.**
4. **Hillstrom HJ, Whitney K, McGuire J, Furmato J, Brower D, Bhimji S, Song J, Ledoux W, Yoo Duke, Sherer R: "Initial Objective Assessment of a Preformed Adjustable Insole for Use in a Conventional Diabetic Shoe - A Single Subject Design, Phase II - Instrumented Gait Analysis", A Final Report Submitted to Darco Company, July 31, 1996.**
5. **Hillstrom HJ, Palamarchuk H, Lit RJ, Gualtieri GM, Bhimji S: "The Biomechanics of Athletic Walking: Optimal Shoe Gear Design", A final report submitted to New Balance Athletic Shoe, inc., April 28, 1997**

## **INVITED TALKS AND SEMINARS**

1. **Seminar - Hillstrom, HJ, et al., "A Study of Signal Processing Techniques as Applied to the EMG," Drexel Biomedical Engineering Seminar Series, Philadelphia, PA; 1981.**
2. **Seminar - Hillstrom, HJ, et al., "Myoelectric Control: An Alternative to Conventional Prostheses," Delaware Valley Locomotion Society, Philadelphia, PA; January 29, 1982.**
3. **Seminar - Hillstrom, HJ, and Moskowitz, G., "Myoelectric Control of Lower Limb Prostheses," New York Academy of Science, New York City; April 15, 1982 (with ).**

4. Seminar - **Hillstrom, HJ**, et al.,: "Volitional Control of Myoelectric Lower Limb Prostheses," Dept. Biomedical Engineering, Worcester Polytechnic Institute, Worcester, MA; February 21, 1983.
5. Symposium - **Hillstrom, HJ**, et al.,: "A Volitionally Controlled Myoelectric A/K Prosthesis - The Drexel-Moss Knee," Advanced Engineering Technology/Robotics for the Handicapped, a Symposium sponsored by the Governors Committee on Employment of the Handicapped, Harrisburg, PA; November 1984.
6. Seminar - **Hillstrom, HJ**, et al.,: "EMG Nonstationarity and Candidate Adaptive Systems," Prosthetic and Orthotic Seminar Series, Moss Rehabilitation Hospital, Philadelphia, PA; January 1986.
7. Seminar - **Hillstrom, HJ**, et al.,: "A Quantitative Diagnostic Technique For Discriminating Between Spasticity and Contracture at the Ankle in Patients with Equinus Deformity," Surgical Grand Rounds, PCPM, Phil., PA; April 1988.
8. Seminar - **Hillstrom, HJ**, and Sanner, W., "The Application of Gait Analysis to Podiatric Pathologies". 1990-1991 Wednesday Evening Surgical Seminar Series at PCPM, Philadelphia, PA; October 17, 1990.
9. Seminar - **Hillstrom, HJ**, "The Biomechanics of Posture and Locomotion," Biomedical Engineering Seminar Series, Drexel University, Philadelphia, PA, March, 1992.
10. Seminar - **Hillstrom, HJ**, and Selby-Silverstein, L., et al.,: "Posture and Locomotion/ Down Syndrome," (with ) Pediatric Physical Therapy Special Interest Group, PCPM , Philadelphia, PA, May 21, 1992.
11. Lecture - **Hillstrom, HJ**, et al.,: "Parameters of Posture and Locomotion and Their Relevance to Insole Design and Performance," Dr. Scholl division of Schering-Plough, Memphis, Tennessee, November 16, 1992.
12. Seminar - **Hillstrom, HJ**, et al.,: "Equinus Deformity", Biomechanics Seminar Series, Hahnemann University, Philadelphia, Pa - May, 1993.
13. Seminar - **Hillstrom, HJ**, et al.,: "Gait Analysis: To Objectively Study Posture and Locomotion", Biomedical Engineering Seminar Series, Drexel University, Philadelphia, PA, October, 1993, (with L. Selby-Silverstein and M. Besser).
14. Lecture - **Hillstrom, HJ**, et al.,: "Instrumented Gait Analysis: Objective Diagnosis and Treatment Effectiveness of Equinus Deformity", American College of Foot and Ankle Surgery (ACFAS), The Fountainbleau Hotel, Miami, Florida, February 2 - 5, 1994.
15. Lecture - **Hillstrom, HJ**, et al.,: "How Do You Ask a Good Research Question?", Research Seminar - Podiatry Institute, Omni Hotel, Atlanta, Georgia, April 7, 1994.
16. Lecture - **Hillstrom, HJ**, et al.,: "Statistics for Clinicians Who Hate Statistics", Research Seminar - Podiatry Institute, Omni Hotel Atlanta, Georgia, April 7, 1994.

17. Lecture - **Hillstrom, HJ**, et al.,: "Final Report on the Initial Objective Assessment of the Dynamic Innersole System (DSIS) - A Single Subject Design", Schering -Plough Health Care Products Corporation, Memphis, Tennessee, May 26, 1994.
18. Lecture - **Hillstrom, HJ**, et al.,: "Preliminary Report on the Evaluation of the Dr. Scholl Heel Guard™ Device", Schering Plough Health Care Products Corporation, Memphis, Tennessee, May 26, 1994.
19. Seminar- **Hillstrom, HJ**, et al.,: "Evidence for a Relationship Between Lower Extremity Structure and Function", Biomedical Engineering, Science, and Health Systems Seminar, Drexel University, November 1999.
20. **Keynote Lecture** - **Hillstrom, HJ**, : "Evidence for a Relationship Between Lower Extremity Structure and Function", Fifth Annual Podiatric Research Society Meeting, Hyatt Regency Hotel, Miami, Florida, February 12, 2000.
21. Seminar - **Hillstrom, HJ**, et al.,: "The Role of Foot Alignment in Diabetic Neuropathic Ulceration", Endocrinology/Diabetes/Metabolism Seminar Series, Temple University Hospital, March 29, 2000.
22. Seminar - **Hillstrom, HJ**, "Hindfoot Kinetics and Kinematics: Clinical Applications of Basic and Advanced Approaches", Physical Therapy, Neuroscience, Biomechanics, and Exercise Science Seminar, University of Delaware, March 17, 2000.
23. **Keynote Lecture** - **Hillstrom, HJ**, "Dynamic Foot Function: Standard and Novel Techniques for Exploring the Relationship Between Lower Extremity Structure and Function", Research Retreat 2000 sponsored by the Foot & Ankle Special Interest Group of the Orthopaedic Section, APTA, Program Theme: Static and Dynamic Classification of the Foot, Annapolis, Maryland, May 19 - 20, 2000.
24. Lecture - **Hillstrom, HJ**, et al.,: "Osteoarthritis: the Association Between Lower Extremity Structure and Function", American College of Rheumatology /American Rheumatology Health Professionals Meeting, San Francisco, CA, November 2001
25. **Meet the Expert** - **Hillstrom, HJ**: "Osteoarthritis: the Association Between Lower Extremity Structure and Function", American College of Rheumatology /American Rheumatology Health Professionals Meeting, San Francisco, CA, November 2001.
26. Gait Symposium – **Hillstrom, HJ**, Song, J, Selby-Silverstein, L., Whitney, K, Furmato, J: "Gait Analysis: A Tool to Discover the Relationship Between Lower Extremity Structure and Function", Region III Podiatry Meeting, Trump Taj Mahal, Atlantic City, N.J., May, 2002.
27. Lecture - **Hillstrom, HJ**, et al.,: "Osteoarthritis: the Association Between Lower Extremity Structure and Function", Temple University Rheumatology Grand Rounds, Philadelphia, P.A., July, 31, 2002.

## SCIENTIFIC AND CLINICAL PRESENTATIONS:

1. Conference - **Hillstrom, HJ**, et al., "Single Microelectrode Voltage Clamping," Tenth Annual Northeast Bioengineering Conference, Dartmouth College, Hanover, New Hampshire; March, 1982.
2. Poster - **Hillstrom, HJ**, et al., "Continuous Current Injection Based Single Microelectrode Voltage Clamping," FASEB - (Biomedical Engineering Society), New Orleans, LA; April, 1982.
3. Conference - **Hillstrom, HJ**, et al., "Optimal Electrode Placement for Prosthetic Limb Control," ACEMB, Philadelphia, PA; September, 1982.
4. Lecture - **Hillstrom, HJ**, et al., "Myoelectric Control of Limb Prostheses," Temple Medical School, elective with Dr. Nathaniel Mayer, Philadelphia, PA; January 27, 1983.
5. Lecture - **Hillstrom, HJ**, et al., "Volitionally Controlled Artificial Limbs," visiting students and faculty from the Department of Biomedical Engineering of Twente University of Technology, The Netherlands, given at Moss Rehabilitation Hospital, Philadelphia, PA; June 14, 1983.
6. Conference - **Hillstrom, HJ**, et al., "Optimal Surface EMG Electrode Placement," 36th Annual Conference on Engineering in Medicine and Biology, Columbus, Ohio; September 1983.
7. Conference - **Hillstrom, HJ**, et al., "Response Times of the Drexel-Moss Knee Prosthesis," 37th Annual Conference on Engineering in Medicine and Biology, Los Angeles, CA; September 1984.
8. Conference - **Hillstrom, HJ**, et al., "EMG Variation in Spatial Pattern Recognition for Prostheses," IEEE Frontiers of Engineering and Computing in Health Care, LA, CA; September 1984.
9. Conference - **Hillstrom, HJ**, et al., "EMG Characterization for Real Time Control," 7th Annual IEEE Frontiers of Engineering and Computing in Health Care, Chicago, IL; September 1985.
10. Conference - **Hillstrom, HJ**, et al., "A 2D Force Feedback Monitor for Repeatable Muscle Contractions," 39th Annual Conference on Engineering in Medicine and Biology, Baltimore, MD; Sept . 1986.
11. Conference - **Hillstrom, HJ**, et al., "Quantitative Force Plate Analysis", Fourth Annual East Coast Clinical Gait Analysis Conference. Penn State University, State College, PA; November 1988.
12. Poster - **Hillstrom, HJ**, et al., "Pennsylvania College of Podiatric Medicine - Clinical and Research Activities at the Gait Study Center", with Fred Kugler, American Podiatric Scientific Exhibit Program. 77th Annual APMA Meeting, Boston, MA; August 1989.
13. Poster - **Hillstrom, HJ**, et al., "APMA funded Research at PCPM": findings from four projects:
  - "A Quantitative Diagnostic Technique for Discriminating Between Spasticity and Contracture at the Ankle Joint in Patients with Equinus Deformity" [PI: H. Hillstrom, Ph.D.]
  - "An Assessment of Oblique Base Wedge Osteotomy Stability in the First Metatarsal Utilizing Different Modes of Internal Fixation" [PI: A Landsman, D.P.M., Ph.D.]
  - "Computerized 3-D Analysis of Midtarsal Joint Kinematics" [PI: B. Hirsch, Ph.D.]
  - "Diabetic Neuropathy" [PI: J. Burke, Ph.D.]American College of Foot Surgeons (ACFS), San Francisco, CA; February 13-16, 1991.

14. Poster - The Gait Study Center and APMA funded Research at PCPM  
 "A Quantitative Diagnostic Technique for Discriminating Between Spasticity and Contracture at the Ankle Joint in Patients with Equinus Deformity" [PI: H. Hillstrom, Ph.D.].  
 "An Assessment of Oblique Base Wedge Osteotomy Stability in the First Metatarsal Utilizing Different Modes of Internal Fixation" [PI: A Landsman, D.P.M., Ph.D.]  
 "Computerized 3-D Analysis of Midtarsal Joint Kinematics" [PI: B. Hirsch, Ph.D.]  
 "Diabetic Neuropathy" [PI: J. Burke, Ph.D.]  
 Region III Podiatry Meeting, Atlantic City, NJ, April 30 - May 1, 1991.
15. Lecture - **Hillstrom, HJ**, et al., "Pediatric Gait Lab Analysis," American College of Podopediatrics: Pediatric Foot and Ankle Disorders, The Rittenhouse, Philadelphia, PA, June 19 - 20, 1992.
16. Lecture - **Hillstrom, HJ**, et al., "Advanced Gait Analysis: Current Status," 6th Annual Foot and Ankle Institute Seminar - Current Approaches to Today's Problems. The Ritz Carlton, Philadelphia, PA, October 9-11, 1992.
17. Lecture - **Hillstrom, HJ**, et al., "Robust Intent Recognition for Prosthetic Control", 14th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Paris, France, October 29-November 1, 1992.
18. Lecture - **Hillstrom, HJ**, et al., "Practical Gait Analysis", Seventh Annual Foot and Ankle Institute Seminar, The Ritz Carlton, Philadelphia, PA, September, 1993.
19. Lecture - **Hillstrom, HJ**, et al., "Gait and Posture Analysis", Insensitive Foot Seminar, Department of Orthopedics, Pennsylvania College of Podiatric Medicine (PCPM), Philadelphia, Pennsylvania, March 12-13, 1994.
20. Lecture - **Hillstrom, HJ**, et al., "Instrumented Gait Analysis: Objective Diagnosis and Treatment Effectiveness Assessment of Equinus Deformity", Eighth Annual Foot and Ankle Institute Seminar, Philadelphia, PA, September, 1994.
21. Lecture - **Hillstrom, HJ**, et al., "The Effect Of Foot Orthoses On The Standing Stability Of Geriatric Females: A New Method To Assess Stability", 16th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Baltimore, Maryland, November 3, 1994.
22. Lecture - **Hillstrom, HJ**, et al., "Gait Analysis: What Are The Biomechanical Factors Of A Given Patient's Osteoarthritis?", Veteran Administration Hospital, Philadelphia, PA, January 1995.
23. Lecture - **Hillstrom, HJ**, et al., "Quantitative Gait Analysis And The MRI", MIPG, Philadelphia, PA, February 1995.
24. Lecture - **Hillstrom, HJ**, et al., "Can Foot Orthoses Treat Osteoarthritis Up the Kinetic Chain?", Ninth Annual Foot and Ankle Institute Seminar, Philadelphia, PA, September, 1995.
25. Workshop - **Hillstrom, HJ**, et al., "Biomechanically Based Evaluation And Treatment Of Lower Extremity Osteoarthritis: The Role Of The Foot And Ankle", American College of

Rheumatology/American Rheumatology Health Professionals Meeting, San Francisco, CA, October 21, 1995.

26. Lecture - **Hillstrom, HJ**, et al., "Effects of Foot Type and Diabetic Neuropathy on the Biomechanical Function of the Foot", - American College of Foot and Ankle Surgeons 54th Annual Meeting & Scientific Seminar, Sheraton New Orleans, Louisiana, March 23, 1996.
27. Lecture - **Hillstrom, HJ**, et al., "Biomechanically Assay of a Specialty Designed Insole for Plantar Fasciitis/Heel Spur Syndrome", Podiatric Research Society held at the American College of Foot and Ankle Surgeons 54th Annual Meeting & Scientific Seminar, Sheraton New Orleans, Louisiana, March 22, 1996.
28. Lecture - **Hillstrom, HJ**, et al., "The Biomechanics of Foot Types", Tenth Annual Foot and Ankle Institute Seminar, Philadelphia, PA, September, 1996.
29. Workshop - **Hillstrom, HJ**, et al., "Biomechanically Based Evaluation and Treatment of Lower Extremity Osteoarthritis: The Role of the Foot and Ankle", American College of Rheumatology/American Rheumatology health Professionals Meeting, Orlando, FL October 1996.
30. Lecture - **Hillstrom, HJ**, et al., "Objective Assessment of An Adjustable Insole for Use in a Conventional Diabetic Shoe", 2nd Annual Meeting of the Podiatric Research Society, Palm Springs, CA, Feb. 4, 1997.
31. Lecture - **Hillstrom, HJ**, et al., "Objective Assessment of An Adjustable Insole for Use in a Conventional Diabetic Shoe", Eleventh Annual Foot and Ankle Institute Seminar, Philadelphia, PA, September, 1997.
32. Workshop - **Hillstrom, HJ**, et al., "Relationship of Skeletal Malalignment and Osteoarthritis: Biomechanically Based Evaluation and Treatment", American College of Rheumatology /American Rheumatology Health Professionals Meeting, Washington, DC, November 1997.
33. Workshop - **Hillstrom, HJ**, et al., "Skeletal Malalignment Assessment Related to Osteoarthritis: Biomechanical and Clinical Basis", American College of Rheumatology /American Rheumatology Health Professionals Meeting, San Diego, CA, November 1998.
34. Study Section - **Hillstrom, HJ**, et al., Foot and Ankle, American College of Rheumatology /American Rheumatology Health Professionals Meeting, San Diego, CA, November 1998.
35. Lecture - **Hillstrom, HJ**, et al., "Evidence for a Relationship Between Structure and Function", University of Texas, San Antonio, April 1999.
36. Workshop - **Hillstrom, HJ**, et al., "Assessment of Skeletal Alignment as Related to Arthritis - a Hands On Workshop", American College of Rheumatology /American Rheumatology Health Professionals Meeting, Boston, MA, November 1999.
37. Study Section - **Hillstrom, H.**, McGuire, J., Whitney, K.,: Foot and Ankle Study Section, American College of Rheumatology /American Rheumatology Health Professionals Meeting, Boston, MA, November 1999.

38. Poster - **Hillstrom HJ**, Brower DJ, Bhimji S, McGuire J, Whitney K, Snyder H, Zonay L, Clayburne G, Sieck M, Schumacher HR: "Assessment of Conservative Realignment Therapies for the Treatment of Varus Knee Osteoarthritis: Biomechanics and Joint Pathophysiology", 5th Annual Meeting of the Gait and Clinical Movement Analysis Society, Mayo Clinic, Rochester, MN, April 12-15, 2000.
39. Workshop – Rieger-Krugh, C., **Hillstrom, H.**, McGuire, J., Whitney, K.: "Clinical Decision Making for Causes of Skeletal Malalignment with OA", American College of Rheumatology /American Rheumatology Health Professionals Meeting, Philadelphia, PA, November 2000.
40. Workshop – **Hillstrom, H.**, Brower, D., Rieger-Krugh, C.: "Objective Gait Analysis", American College of Rheumatology /American Rheumatology Health Professionals Meeting, Philadelphia, PA, November 2000.
41. Study Group - **Hillstrom, H.**, McGuire, J., Whitney, K: Foot and Ankle Study Group, American College of Rheumatology /American Rheumatology Health Professionals Meeting, Philadelphia, PA, November 2000.
42. Poster - Mahan, KT, **Hillstrom, HJ**, Bhimji, S: "Biomechanical Efficacy Of The Evans Calcaneal Osteotomy", 6th Annual Meeting of the Gait and Clinical Movement Analysis Society, Sacramento, CA, Gait And Posture, (11)2: 2001.
43. ACR Clinical Science Symposium – Felson, D., **Hillstrom, HJ.**, Sharma, L., Krohn, K: "Knee Osteoarthritis: A Biomechanical Approach to Pathogenesis and Treatment", American College of Rheumatology /American Rheumatology Health Professionals Meeting, San Francisco, CA, November 2001.
44. Study Group - **Hillstrom, H.**, McGuire, J., Whitney, K: Foot and Ankle Study Group, American College of Rheumatology /American Rheumatology Health Professionals Meeting, San Francisco, CA, November 2001.
45. Workshop – Rieger-Krugh, C., **Hillstrom, H.**, McGuire, J., Whitney, K.: "Skeletal Malalignment Workshop: Clinical Case Studies", American College of Rheumatology /American Rheumatology Health Professionals Meeting, San Francisco, CA, November 2001.
46. Poster - **Hillstrom HJ**, Whitney, Song, J., McGuire, J., Bhimji, S., McIlwain, S., Newman, L., Crispell, Kim, P., Granger, D.: "Evidence for a Causal Link Between Shoe Structure and Lower Extremity Function: A Pilot Study", 7th Annual Meeting of the Gait and Clinical Movement Analysis Society, Chattanooga, TN, April 17-20, 2002.
47. Lecture – **Hillstrom, H.J.**, Song, J., Mahan, K.T.: Index of Pronation, VIII EMED Scientific Meeting, July 31<sup>st</sup> – August 3<sup>rd</sup>, 2002, Kananaskis, Alberta, Canada



## **OTHER PROFESSIONAL ACTIVITIES**

### *National Technical Committees*

1986 – 1987: Member of the Podiatric Research Advisory Committee (PRAC) sponsored by the American Podiatric Medical Association (APMA)

### *Local Technical Committees*

1999 – present: Member of the Medical Education and Research Committee Scientific Advisory Board for the Eastern Pennsylvania Chapter of the Arthritis Foundation

## **TEACHING EXPERIENCE:**

1. Lecture - "Negative Capacitance Amplifiers: The Purpose and Function in the Time and Frequency Domains," WPI Biomedical Instrumentation Graduate Course, Worcester, MA; 1979.
2. Lecture - "Myoelectrical Control of Lower Limb Prostheses," as part of the Biomechanics Course, senior elective, Drexel University, Philadelphia, PA, May 1981.
3. Lecture - "Electromyography," Department of Biomedical Engineering, Drexel University graduate student course Neurophysiology of Posture and Locomotion, Philadelphia, PA; February 23, 1982.
4. Lecture - "Myoelectric Control of Externally Powered Prostheses," Department of Physical Therapy, Temple University, elective with Kevin Cody, Ph.D., Philadelphia, PA; November 1982.
5. Lecture - "The EMG and Myoelectric Control," Department of Mechanical Engineering and Mechanics, Biomechanics group, Drexel University, Philadelphia, PA; May 1983.
6. Lecture - "EMG, Locomotion, and Prosthetics," lecture series, Department of Mechanical Engineering Biomechanics group, Drexel University, Philadelphia PA; May 1985.
7. Lecture - "EMG, Myoelectric Control Strategies, and Spatial Pattern Recognition," Department of Mechanical Engineering, Drexel University, Philadelphia, PA; May 1987.
8. Lecture - "Fundamental Physics of Biomechanics," First Year Biomechanics, Pennsylvania College of Podiatric Medicine, Philadelphia, PA; January 1994 - 1998.
9. Lecture - "Introduction to the Gait Cycle," First Year Biomechanics, Pennsylvania College of Podiatric Medicine, Philadelphia, PA; March 1988 - 1998.
10. Workshop - "Introduction to the Gait Laboratory," First Year Biomechanics, PCPM, Philadelphia, PA; March-May 1988-1998 (formally with Fred Kugler, as of 1996 with Safia Bhimji), *four or five sessions per academic year.*

11. Workshop - "Gait Analysis Methods and the Biomechanical Parameters of Posture and Locomotion," Third Year Orthopedics, PCPM, Philadelphia, PA; 1988-1991 (with Fred Kugler), *twenty sessions bi-weekly per Academic year.*
12. Lecture - "Gait Analysis of Podiatric Pathologies", Third year Podiatric Orthopedics, PCPM, Philadelphia, PA; November 1994-1998, March 1998.
13. Workshop - "Plantar Aspect Foot Pressure Measurement" Third Year Orthopedics, PCPM, Philadelphia, PA; 1989-1991 (with Fred Kugler and Ilene Young), *twenty sessions bi-weekly per Academic year.*
14. Lecture - "Volitional Myoelectric Lower Limb Prostheses," lecture series - Department of Mechanical Engineering and Mechanics - Biomechanics Group, Drexel University, Philadelphia, PA; May 1989.
15. Lecture - "Quantitative Gait Analysis", lecture series - Department of Mechanical Engineering and Mechanics - Biomechanics Group, Drexel University, Philadelphia, PA; May 1990.
16. Workshop - "Gait Analysis Methods as Applied to the Foot and Ankle," given within a M.S. level Physical Therapy course of Temple University (with Fred Kugler and Dan Disabatino) June 1991.
17. • Course - "Clinical Biomechanics" - course offered to residents at the Philadelphia College of Osteopathic Medicine (PCOM) held in the fall of 1991, 1993, 1995, 1997-1999.
18. • Course - "Introduction to Research Design" - six week course offered annually to TUSPM (PCPM) students; March 1992, September 1992 - 1995, March 1996 - 1999.
19. Lecture - "EMG Signal Processing and Prosthetic Limb Control", Department of Mechanical Engineering and Mechanics, Graduate Biomechanics Course, Drexel University, Philadelphia, PA, February 20, 1992.
20. Workshop - "Parameters of Posture and Locomotion", Department of Biomedical Engineering and Science Institute, Graduate Med. Sci. III course, Drexel University, Philadelphia, PA, June 1992-2002.
21. Workshop - "Gait Analysis: Quantitative Biomechanics of Posture and Locomotion", Department of Mechanical Engineering and Mechanics, Graduate Biomechanics Course, Drexel University, Philadelphia, PA, 1992, 1993.
22. Lecture - "Biomaterials", Department of Surgery, Digital - Metatarsal Surgery Course, Pennsylvania College of Podiatric Medicine, Philadelphia, PA, May 18, 1992-1995.
23. Workshop - "Gait Analysis: Clinical Applications", Department of Physical Therapy, Shriners Hospital for Crippled Children, Philadelphia, PA, July 17, 1992.

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• - Course

24. Workshop - "Introduction to Posture and Locomotion Parameters", Department of Physical Therapy, Quantitative Methods Graduate Course, Thomas Jefferson University, Philadelphia, PA, two sessions in November of 1992, 1993, and 1994.
25. Workshop - "Introduction to Posture and Locomotion Parameters", Department of Physical Therapy, Hahnemann University - Entry level students - May 1993-1995, July 1996.
26. Workshop - "Posture, Locomotion, and Rehabilitation Engineering", Department of Bioengineering, University of Pennsylvania, Rehab. Eng. Inst. - July 1993, 1994.
27. Workshop - "Introduction to Posture and Locomotion", Harcum PT Assistants, September 1993.
28. Workshop - "Gait Analysis: Clinical Applications", Department of Physical Therapy, Novacare, Philadelphia, PA, Spring, 2001.
29. Workshop - "Introduction to Posture and Locomotion", School of Biomedical Engineering, Science, and Health Systems, undergraduate course, Drexel University, Philadelphia, PA, January, 2000-2002.
30. • Course - "Biomechanics of Human Movement" - course offered to Temple University Kinesiology graduate students held in the winter/spring of 2002.

#### **GRADUATE STUDENTS ADVISED:**

Thompson, Elaine C. {*committee member*}: Ph.D. dissertation, "The Effect of Sural Nerve Stimulation on Limb Clearance in Patients with Hemiplegia", December 1990.

Perlberg, Gil {*secondary advisor*}: M.S. thesis, "Objective Detection of Equinus Deformity and Identification of its Sources", June 1991.

Maurer, Brian {*secondary advisor*}: M.S. thesis, "Quantitative Identification of Ankle Equinus Deformity with Applications for Treatment Assessment", September 1992.

Selby-Silverstein, Lisa {*secondary advisor*}: Ph.D. dissertation; "Foot Orthoses: Their Effect on Gait in Down Syndrome", June 1993.

Smith, Nancy {*primary advisor*}: M.S. thesis, "Comparison of Kinematic Measurements: External Markers and Three-Dimensional MRI Reconstruction," In progress.

Lapointe, Steve {*secondary advisor*}: Ph.D. dissertation, "An Instrumented Linkage for the Measurement of the Rotatory Stability of the Human Ankle Complex," June 1996.

- Song, Jinsup *{primary advisor}*: Ph.D. dissertation, "Foot Type Biomechanics and the Diabetic Foot: Plantar Pressure Relationship to Neuropathy," June 1999.
- Scahill, Kathy *{primary advisor}*: M.S. thesis, "Three-Dimensional Moments and Rotations about the Rearfoot," In progress.
- Behler, Jill *{primary advisor}*: M.S. thesis, "Relationship of the Center of Pressure to a Point within the Pelvis in Geriatrics: Postural Stability with and without Foot Orthoses." In progress.
- Ledoux, William *{primary advisor}*: Ph.D. Dissertation, "The Biomechanical Model of the Human Foot", June 1999.
- Bhimji, Safia *{primary advisor}*: M.S. thesis, "Foot Orthoses: Effect on Tibial Torsion in Down Syndrome", June 1996.
- Gina Gualtieri: *{primary advisor}* M.S. thesis, "Biomechanics of Increased Heel Height in Race Walking", June 1996.
- Robyn Lit: *{primary advisor}* M.S. thesis, "The Biomechanics of Athletic Walking: Optimal Shoe Gear Design", In progress.
- Melanie Kahler: *{primary advisor}* M.S. thesis, "Knee Osteoarthritis Biomechanics: A Pilot Study of Foot Orthosis Efficacy", June 1998.
- Rosa Ibanez: *{primary advisor}* M.S. thesis, "Neural Network Model of the EMG to Ankle Moment Relationship", December 1998.
- James Furnato, DPM: *{secondary advisor}* Ph.D. thesis, "Ultrasound Measures of Diabetic Ulcers: Wound Characterization", In progress.
- David Brower: *{secondary advisor}* Ph.D. thesis, "Biochemical Correlates of Biomechanical Treatment of Osteoarthritis", In progress.
- Chuck Bartish: *(secondary advisor)* M.S. thesis, "Six Degree of Freedom Knee Kinematic Assessment of Conservative Ankle Stabilization During Activities of Daily Living", June 1998.
- Stacey Ringleb: *(secondary advisor)* M.S. thesis, "Correlation and Sequencing of Electromyographic Signals with the Kinematics of Gait", June 1999.
- Stacey Ringleb: *(secondary advisor)* Ph.D. thesis, "Biomechanical Model of the Human Foot", In Progress.
- Sue Barker: *(secondary advisor)* Ph.D. thesis, "Accuracy and Repeatability of the Instrumented Gait Mat II for the Assessment of Hemiplegic Gait", in progress.
- Ann Suter: *(primary advisor)* M.S. thesis, "Three Dimensional Kinematics and Kinetics of the Lower Extremity while Landing from a Jump with a Prophylactic Ankle Brace: A Pilot Study", May 2001.

Abbey Dean: (*secondary advisor*) Ph.D. thesis, "Resistive Strength Training to Improve Clinical Outcomes for the Grade 1a,1b Cardiac Patient Awaiting Transplant", in progress.

### **ADVANCED CURRICULUM DEVELOPMENT**

Course - "Clinical Biomechanics" - course offered to residents at the Philadelphia College of Osteopathic Medicine (PCOM) held in the fall of 1991, 1993, 1995, 1997, 1998, 1999.

Course - "Introduction to Research Design" - six week course offered annually to TUSPM students; March 1992, September 1992 - 1995, March 1996 - 2002.

Course - "Biomechanics of Human Movement" - course offered bi-annually to TU graduate Kinesiology students; January 2002.

### **COLLEGE AND UNIVERSITY SERVICE**

|                |                                                            |
|----------------|------------------------------------------------------------|
| 1991 - Present | Secretary to the TUSPM (formerly PCPM) faculty             |
| 2000 - Present | Treasurer to the TUSPM faculty                             |
| 1996 - 1998    | Member of the Appointment, Tenure, and Promotion Committee |
| 1989 - Present | Member of the TUSPM candidate student interview team       |

### **COMMUNITY SERVICE**

|             |                                                                              |
|-------------|------------------------------------------------------------------------------|
| 1991 - 1999 | Head Coach or Assistant Coach in the Conshohocken Little League              |
| 1991 - 2000 | Staff for the Greater Norristown Wrestling Club - dual meets and tournaments |